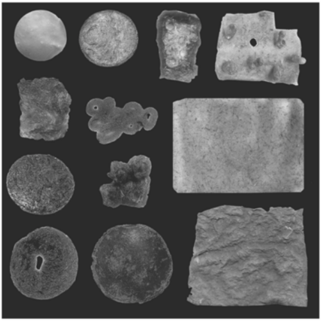
FIELD

How to Grow a Field?
Training Brief

This zine was made by FIELD collaborators including Supermrin, Jil Berenblum, and Xenia Adjoubei and supplements their Design Talk and Workshop **How to Grow a Field** in Fall 2021.

Inspired by the Year of Science at Barnard, the Design Center's 2021-22 Design Talk Series featured talks and workshops by artists and designers whose practice intersects with STEAM. This program was organized by Design Center Coordinator Rebecca Naegele.



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Field was designed and built by Supermrin, Jil Berenblum, Jessica Fertonani Cooke, and Ane Gonzalez Lara with support from Guerilla Science, the University of Cincinnati, and Pratt Institute.

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Introduction

Context

Against the challenges afforded by extreme climate change, deep social inequity, and their shared impacts within a globally interconnected world, architects, planners, artists and makers, more than ever before are rethinking our relationships to nature, cities and the materials we embedd within them. Lawn grass emerges as one example of an artificially constructed, genetically modified "nature", that has overridden the human-made world. Omnipresent within our public spaces, parks, city centers, streetscapes, and private yards, grass has come to represent the homogeneity, control, and order that we have wielded upon both nature and our bodies.

Urban manicured lawns are ecologically unsustainable, require extensive resources, water, fertilizer, soil, maintenance and care. Yet these grasses have psychological associations to social order and safety. A well kept lawn affords visibility and surveillance over shared public space. In our suburbs, lawns are a symbol of wealth, beauty, home ownership, and the American dream. How might we as designers engage with wider audiences to rethink our shared relationships with urban grasses, nature, and our own diverse bodies? How might we engage with our shared biases around safety, beauty, aging, and time?

What is Field?

Field is a bio-arts laboratory and research space that creates new discourse around our relationships with nature, time and the body. *Field* prompts audiences to reflect on their own relationships to manicured public lawns and engage within their cities to rethink the homogeneity, order, and control present within the built environment. Ultimately, Field asks us to reflect on our own biases, assumptions, and desires while navigating shared space.

Broader Impacts

Field is a critique of the urban typology of the manicured civic park, replicated within cities the world over, and the billion-dollar industry it advances. It is estimated that lawns comprise more than 3 times the acreage of agricultural corn production in the US, making them the single largest irrigated crop—covering about 128,000 sq.km. of public and private land (Milesi 2005). In recent years, movements such as "no-mow" lawns are being popularized in order to rethink our relationships with these grasses. *Field* seeks to shift our ecological and aesthetic understandings of these grasses, and to rethink the current policies embedded within contemporary urban development programs that perpetuate their use. The project is a means to engage city workers, planners, and architects to generate discourse around power, space, and expanded ecology. The resulting landscape interventions engage urban dwellers from all walks of life. They are affective and embodied experiences of the urban 'wild' for adults and children alike.

Field Workshop

Learning Outcomes

Workshop participants will:

- Engage in critical discourse around our relationships to nature, urban grasslands, and manicured lawns.
- Develop tools to identify and critique established structures of power within the built environment.
- Develop new approaches to working with new materials.
- Learn recipes to create a grass-based bio-plastic and experiment with fabrication techniques to work with this material.
- Develop strategies to communicate concepts around climate science to a broader public audience.

Schedule of Events

2:00pm - Project introductions and group discussion
2:15pm - Tactile discussion, material properties of bio-plastics
2:45pm - Introduction to bio-materials
3:00pm - Break
3:15pm - Grass-based biomaterials tutorial
3:45pm - Experiments with fabrication techniques
4:15pm - Debrief and sharing

Developing Grass-based Bio-plastics

Preparation

Most of Field's biomaterials are found or made of ingredients that are perishable that will need to be created new every time Field is exhibited. Allow at least 2-3 weeks of lead time before an event to ensure that all staffing and materials are available. During this time frame, review the Field inventory of items to prepare the grass pulp, the carboxymethyl cellulose, and any additional modifiers you might use.

We are excited to share the proprietary recipes below with a wider audience. To this end, the recipes are free and published using a Creative Commons BY-NC-SA license. This means that individuals or organizations are free to share and adapt our recipes with appropriate attribution and for non-commercial purposes only. While we hope you can learn as much as we have from developing these tools, our ask is that you respect the work that Streetlight and our collaborators put into producing this and refrain from copying it in part or whole without proper attribution or consent. If you would like to partner on the distribution or adaptation of our recipes, we would love to work together.

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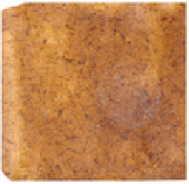


A. From grass to pulp

The first recipe focuses on creating grass pulp and extracting cellulose from the grass. We recommend not to use the utensils used for this recipe for normal household cooking.

Materials

Large waste bags
8 quart pan
Running water
Soda ash
Blender
Nylon Straining Bag Fine Mesh Food Strainer
PH strips to monitor PH levels

Step-by-step instructions

Step 1: Collect grass from your selected site. You can contact the representatives of your nearest park and ask them for their mowing schedule. Usually, the grass clippings are waste materials and Park officials are usually happy to share the glass clippings with you.

Step 2: Dry the grass clippings. Spread them thin and even over a flat and dry surface. The key is to avoid the grass getting moldy so be mindful of keeping the grass in a sunlit and ventilated area. You can skip this step if you are boiling the grass immediately. Drying is only needed to store the grass clipping for a longer period of time.

Step 3: Boil the grass clippings with soda ash (3 tbsps for one 8 quart pot) for four hours. The boiling of grass creates a strong smell and we encourage you to ventilate the kitchen well during the process.

Step 4: Wash the grass in running water using the nut bags to retain all that good cellulose. Wash several times, checking pH to ensure the grass reaches neutral levels. The pH scale ranges from 0 to 14, with 7 being neutral. pHs less than 7 are acidic while pHs greater than 7 are alkaline (basic). Soda ash makes the grass alkaline, so we want to ensure it's nicely cleaned before we use it to make biomaterial.

Step 5: Blend the grass in a good quality blender. Add clean water to it to make sure your blender doesn't get overheated. It should look like a delicious green smoothie. The better you blend it, the smoother the consistency of your material will be. You can experiment with different blends for different kinds of results.

Step 6: Strain the blended grass again to remove all excess water. You are now left with a beautiful pulpy material that is mostly cellulose. You will notice the color changes the more you wash it too. This is the raw material for all the recipes you will work with.

Step 7: Ensure you refrigerate your grass pulp until use. Biomaterials are only bio because they, like all living things, decay over time. So just like the other vegetables in your fridge, use them within 5 days or they will spoil. If you want to extend shelf life, you can experiment with freezing them too.

Contd: from grass to pulp

Steps prior to arriving at Governors Island. All these steps take place at the organizer's laboratory.

1. Collect grass

Grass collected from Brooklyn public parks.

2. Dry grass

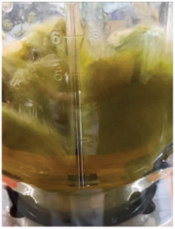
Grass is laid out in a flat surface and dried out. This step prevents the grass from developing any mold.

3. Boil Grass

Grass is boiled with alkaline water to separate the cellulose from the plant matter. This process takes several hours.

4. Wash Grass

After boiled, grass is rinsed in a nutbag,



5. Blend Grass

The better your grass is blended, the smoother the final consistency of your material.

6. Strain Grass

Pulp is collected. This pulp will be the main component of the bio-material.

B. From pulp to bioplastic

The second recipe focuses on creating grass-based biomaterial from your grass pulp. Once again, we recommend not to use the utensils used for this recipe for normal household cooking.

Biomaterial Station

Mixing bowls (2)
Scale
Measuring Cup
Blender
Pot
Stove
Spatula
Funnel
Caulking Gun
Refillable Extruder

Ingredients

150g Grass Pulp (Pre-made from grass clippings, refer above)
95ml Carboxymethylcellulose (CMC) 3% solution
190ml Water
50ml Glycerol
35g Potato Starch
10ml Vinegar
10ml Sugar

Step-by-step instructions

Step 1: Weigh out carboxymethyl cellulose(CMC) and water. Ratio: 1:3. Mix ingredients together until homogenous - you can blend them for a better consistency. The CMC will gel with time. Refrigerate until use.

Step 2: Measure out water, CMC solution, and glycerol. Mix together.

Step 3: Add grass pulp to the mixture. Mix well.

Step 4: Measure out vinegar, potato starch, and sugar. Add them into the pot.

Step 5: Blend all the ingredients for a final time in your blender. This ensures a finer finish.

Step 6: Cook your bioplastic on a stove. Take safety precautions as you would in a kitchen. Use a spatola to continuously stir the pot, ensuring your material cooks evenly and the bottom of the pot doesn't burn. Keep a slow, steady heat. You will start to see the material thicken and curdle. When much of the water has evaporated, and the mixture is sticky and pasty to the touch, you will know that your bio-plastic is ready for use.

Step 7: Fill out your refillable caulk gun extruders with your bio-plastic and seal with a lid. Keep refrigerated until use. For best results use immediately. The material will start to thicken and will be harder to extrude within a few days.

Step 8: Use as desired, air dry or place in dehydrator unit.

B. From pulp to bio-plastic.

Steps to be demonstrated for workshop participants at Governors Island

1. Prepare CMC solution

Weigh out CMC and water. Ratio: 1:3. Blend.

2-5. Measure ingredients

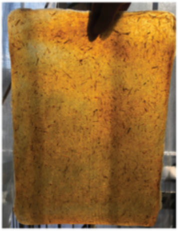
Liquids first, then pulp, and finally starch, vinegar, sugar. Blend.

6. Heat bio-material

Cook your bioplastic on a stove or a hot plate. Stir continuously.

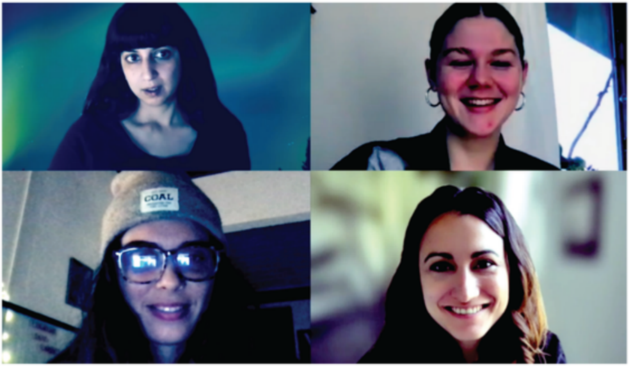
7. Pour into sheets or fill into extruders

Keep refrigerated until use. For best results use immediately.



8. Let bio-material dry

The bio-material will dry out overnight, or in a few hours in a dehydrator.



Supermrin is an Indian artist working at the intersections of architecture, art, and design. She is interested in conceptions of reality, pleasure, and nature within eastern practices. Supermrin is a Visiting Artist at the Graduate Architecture and Urban Design (GAUD) Program at Pratt Institute, and an Assistant Professor of Art at the School of Art, University of Cincinnati. She founded Streetlight in 2016 as a critical spatial research and design laboratory for decolonizing public space.

Jessica Fertonani-Cooke's mestiza heritage (Brazil and Hawaii), informs her research of third-place identities. Influenced by her involvement with indigenous communities throughout the Americas (primarily Tohono O'odham and Guarani), her performances utilize tribal knowledge to create border-crossing rituals between sites and identities. Her projects on the US-Mexico border are the foundation for Field's territorial research. Her past works equip her to engage with diverse communities and develop collaborative performances within politically loaded spaces.

Jil Berenblum is an industrial designer at the Cartier Innovation Lab and a biomaterials researcher with Expressive Matter at Genspace. She is working on building a set of skills that both understand the needs of existing commercial fabrication spaces, but can also answer the urgency with which we need to integrate more sustainable and responsible practices in design.

Ane Gonzalez Lara is an Assistant Professor of undergraduate architecture at Pratt Insitute's School of Architecture, and the co-founder of Idyll Studio. Her professional work with Idyll balances social and cultural concerns with extensive formal and material research. She has developed academic research initiatives as part of her studio teaching that have examined the United States-Mexican border and the Korean demilitarized zone, and has attended conferences on these topics including a roundtable at the 2018' Venice Biennale.